

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Presently amended) An optical semiconductor device with a multiple quantum well structure, comprising:
at least one combination of alternating well layers and barrier layers, both ~~further~~ comprising various semiconductor layers, said well layers ~~further~~ comprising a first composition based on a nitride semiconductor material with a first electron energy, said barrier layers ~~further~~ comprising a second composition of a nitride semiconductor material with electron energy which is higher in comparison with the first electron energy, and a radiation-active quantum well layer [[, layered in direction of growth]] for which the well layers and barrier layers form a superlattice, the well layers of the first composition are essentially non-radiating well layers below the radiation-active quantum well layer.
2. (Previously presented) The optical semiconductor device according to claim 1, wherein the well layers comprise thin aluminum-indium-gallium-nitride layers and the barrier layers comprise gallium-nitride or aluminum-gallium-nitride layers which are thicker than the well layers and the radiation-active quantum well comprises an indium-gallium-nitride layer.
3. (Previously presented) The optical semiconductor device according to claim 1, wherein the radiation-active quantum well follows an uppermost barrier layer.
4. (Previously presented) The optical semiconductor device according to claim 1, wherein layer thickness of the radiation-active quantum well is greater than layer thickness of the well layers of the superlattice.

5. (Previously presented) The optical semiconductor device according to claim 1, wherein the well layers are thinner than 2 nm and the barrier layers are at least 3 nm thick.

6. (Previously presented) The optical semiconductor device according to claim 2, wherein the well layers and barrier layers are doped with silicon.

7. (Previously presented) The optical semiconductor device according to claim 6, wherein the dopant concentration is from 10^{17} to 10^{18} cm³.

8. (Presently amended) An optical semiconductor device with a multiple quantum well structure, comprising:

at least one combination of alternating well layers and barrier layers, both comprising various semiconductor layers, said well layers comprising a first composition based on a nitride semiconductor material with a first electron energy, said barrier layers comprising a second composition of a nitride semiconductor material with electron energy which is higher in comparison with the first electron energy, and a radiation-active quantum well layer for which the well layers and barrier layers form a superlattice. ~~The optical semiconductor device according to claim 1,~~ wherein within at least one well layer of the superlattice, the In content increases in a direction of growth.

9. (Previously presented) The optical semiconductor device according to claim 8, wherein in the well layer the indium content, remote from the quantum well layer, lies below 5%.

10. (Presently amended) An optical semiconductor device with a multiple quantum well structure, comprising:

at least one combination of alternating well layers and barrier layers, both comprising various semiconductor layers, said well layers comprising a first composition based on a nitride semiconductor material with a first electron energy, said barrier layers comprising a second

composition of a nitride semiconductor material with electron energy which is higher in comparison with the first electron energy, and a radiation-active quantum well layer for which the well layers and barrier layers form a superlattice. The optical semiconductor device according to claim 1, wherein at least one of the well layers of the superlattice has at least one pair of single layers of which a first of the at least one pair, in a direction of growth, has a lower indium content than a second of the at least one pair in a direction of growth.

11. (Previously presented) The optical semiconductor device according to claim 10, wherein the second of the at least one pair has an increased indium content of less than 5% of the first of the at least one pair.

12. (Previously presented) The optical semiconductor device according to claim 10 wherein the well layer comprises a plurality of single layers whose indium content increases from a first of the plurality of single layers lying furthest away from the quantum well layer to a single layer lying closest to the radiation-active quantum well layer.

13. (Previously presented) The optical semiconductor device according to claim 12, wherein the indium content increase is smaller than 5%.

14. (Previously presented) The optical semiconductor device according to claim 10, wherein the indium content of the first of the at least one pair of single layers is less than 5 %.

15. (Previously presented) The optical semiconductor device according to claim 10, wherein a thickness of each of the plurality of single layers comprises at least one monolayer.

16. (Presently amended) The optical semiconductor device according to claim 10, wherein a thickness of each of the plurality of single layers [[comprises]] is approximately one monolayer.

17. (Previously presented) The optical semiconductor device according to claim 2, wherein the radiation-active quantum well follows an uppermost barrier layer.

18. (Previously presented) The optical semiconductor device according to claim 2, wherein layer thickness of the radiation-active quantum well is greater than layer thickness of the well layers of the superlattice.

19. (Previously presented) The optical semiconductor device according to claim 2, wherein the well layers are thinner than 2 nm and the barrier layers are at least 3 nm thick.

20. (Previously presented) The optical semiconductor device according to claim 3, wherein the well layers and barrier layers are doped with silicon.

21. (Presently amended) ~~The optical semiconductor device according to claim 2,~~ An optical semiconductor device with a multiple quantum well structure, comprising:

wherein within at least one well layer of the superlattice, the In content increases in a direction of growth.

22. (Presently amended) ~~The optical semiconductor device according to claim 2,~~ An optical semiconductor device with a multiple quantum well structure, comprising:

at least one combination of alternating well layers and barrier layers, both comprising various semiconductor layers, said well layers comprising a first composition based on a nitride semiconductor material with a first electron energy, said barrier layers comprising a second composition of a nitride semiconductor material with electron energy which is higher in comparison with the first electron energy, and a radiation-active quantum well layer for which the well layers and barrier layers form a superlattice, wherein the well layers comprise thin aluminum-indium-gallium-nitride layers and the barrier layers comprise gallium-nitride or aluminum-gallium-nitride layers which are thicker than the well layers and the radiation-active

quantum well comprises an indium-gallium-nitride layer, wherein at least one of the well layers of the super-lattice has at least one pair of single layers of which a first of the pair, in a direction of growth, has a lower indium content than a second of the pair in a direction of growth.

23. (Previously presented) The optical semiconductor device according to claim 11 wherein the well layer comprises a plurality of single layers whose indium content increases from a first of the plurality of single layers lying furthest away from the quantum well layer to a single layer lying closest to the radiation-active quantum well layer.

24. (Previously presented) The optical semiconductor device according to claim 11, wherein the indium content of the first of the pair of single layers is less than 5%.

25. (Previously presented) The optical semiconductor device according to claim 11, wherein a thickness of each of the plurality of single layers comprises at least one monolayer.